

Applicants: Chong-Jin Oon et al.
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In the Claims

Please amend the claims by replacing all prior versions of the claims pursuant to 37 C.F.R. §1.121 as modified by 68 Fed. Reg. 38611 (June 30, 2003) as follows:

1-68. (Canceled)

69. (Currently Amended) An oligonucleotide which (1) is immobilized, (2) ~~comprises~~ consists of the sequence TACGGACGGAAACT (SEQ ID NO:3), (3) is linked to a fluorescent dye at its 5' terminus, and (4) is linked to a primary amine group at its 3' terminus.

70. (Currently Amended) An oligonucleotide which (1) is immobilized, (2) ~~comprises~~ consists of the sequence TACGGACGGAAACTGTTTTTTTTTTTTT (SEQ ID NO:4), (3) is linked to a fluorescent dye at its 5' terminus, and (4) is linked to a primary amine group at its 3' terminus.

71. (Previously Presented) The oligonucleotide of claim 69 or 70, wherein the fluorescent dye is 6-(fluorescein-6-carboxamido) hexanoate.

72. (Previously Presented) The oligonucleotide of claim 69 or 70; wherein the primary amine group is a C-7 amine.

73. (Previously Presented) The oligonucleotide of claim 69 or 70, wherein the oligonucleotide is immobilized on a solid support.

74. (Previously Presented) The oligonucleotide of claim 73, wherein the solid support is a glass bead.
75. (Currently Amended) An oligonucleotide which (1) is immobilized, (2) ~~comprises~~ consists of the sequence TACGGACAGAAACT (SEQ ID NO:1), (3) is linked to a fluorescent dye at its 5' terminus, and (4) is linked to a primary amine group at its 3' terminus.
76. (Currently Amended) An oligonucleotide which (1) is immobilized; (2) ~~comprises~~ consists of the sequence TACGGACAGAAACTGTTTTTTTTTTTTT (SEQ ID NO:5), (3) is linked to a fluorescent dye at its 5' terminus, and (4) is linked to a primary amine group at its 3' terminus.
77. (Previously Presented) The oligonucleotide of claim 75 or 76, wherein the fluorescent dye is 6-(fluorescein-6-carboxamido) hexanoate.
78. (Previously Presented) The oligonucleotide of claim 75 or 76, wherein the primary amine group is a C-7 amine.
79. (Previously Presented) The oligonucleotide of claim 75 or 76, wherein the oligonucleotide is immobilized on a solid support.
80. (Previously Presented) The oligonucleotide of claim 79, wherein the solid support is a glass bead.
81. (Previously Presented) An oligonucleotide which (1) has a

sequence which corresponds to a portion of a nucleic acid which encodes human hepatitis B virus surface antigen, wherein the sequence is AGGATCAACAACAACCGTA (SEQ ID NO:6), and (2) is linked at its 5' terminus to a biotin group.

82. (Currently Amended) An oligonucleotide which (1) ~~has~~ consists of the sequence ATCGTCCTGGGCTTTCGCAA (SEQ ID NO:7), and (2) is linked at its 5' terminus to a fluorescent dye.
83. (Previously Presented) The oligonucleotide of claim 82, wherein the fluorescent dye is Texas red.
84. (Currently Amended) A composition which comprises a first oligonucleotide and a second oligonucleotide, wherein:
- (a) the first oligonucleotide (1) ~~has~~ consists of the sequence AGGATCAACAACAACCGTA (SEQ ID NO:6), and (2) is linked at its 5' terminus to a biotin group; and
 - (b) the second oligonucleotide (1) ~~has~~ consists of the sequence ATCGTCCTGGGCTTTCGCAA (SEQ ID NO:7), and (2) is linked at its 5' terminus to a Texas red fluorescent dye.
85. (Currently Amended) A method for identifying a human hepatitis B virus surface antigen mutant 145 in a sample which comprises:
- (A) obtaining a viral nucleic acid from the sample;
 - (B) amplifying the viral nucleic acid in a polymerase chain reaction using two primers, wherein
- (1) one primer is a first oligonucleotide which (i) ~~has~~ consists of the sequence AGGATCAACAACAACCGTA (SEQ ID

NO:6), and (ii) is linked at its 5' terminus to a biotin group; and

(2) the other primer is a second oligonucleotide which (i) ~~has~~ consists of the sequence ATCGTCCTGGGCTTTCGCAA (SEQ ID NO:7), and (ii) is linked at its 5' terminus to a fluorescent dye;

(C) obtaining, from the amplified nucleic acid, single stranded nucleic acid which comprises the fluorescent dye; and

(D) contacting the single stranded nucleic acid which comprises the fluorescent dye to an immobilized third oligonucleotide, which oligonucleotide comprises a sequence which (i) corresponds to a portion of a human hepatitis B virus surface antigen nucleic acid, which portion comprises a mutation present at the amino acid at position 145 of human hepatitis B virus surface antigen, (ii) is linked to a fluorescent dye at its 5' terminus, and (iii) is linked to a primary amine group at its 3' terminus, under conditions permitting hybridization between the single stranded nucleic acid which comprises the fluorescent dye and the third oligonucleotide,

wherein hybridization between the single stranded nucleic acid which comprises the fluorescent dye and the immobilized third oligonucleotide identifies the sample as one containing a human hepatitis B virus surface antigen mutant 145.

86. (Canceled)

87. (Previously Presented) The method of claim 85, wherein

the third oligonucleotide comprises the sequence
TACGGACAGAACT (SEQ ID NO:1).

88. (Previously Presented) The method of claim 85, wherein the third oligonucleotide comprises the sequence TACGGACAGAACTGTTTTTTTTTTT (SEQ ID NO:5).
89. (Previously Presented) The method of claim 85, wherein the fluorescent dye which is linked to the third oligonucleotide is 6-(fluorescein-6-carboxamido) hexanoate.
90. (Previously Presented) The method of claim 85, wherein the primary amine group which is linked to the third oligonucleotide is a C-7 amine.
91. (Previously Presented) The method of claim 85, wherein the third oligonucleotide is immobilized on a solid support.
92. (Previously Presented) The method of claim 91, wherein the solid support is a glass bead.
93. (Previously Presented) The method of claim 85, wherein the third oligonucleotide (1) is immobilized, (2) comprises the sequence TACGGACAGAACTGTTTTTTTTTTT (SEQ ID NO:5), (3) is linked to 6-(fluorescein-6-carboxamido) hexanoate at its 5' terminus, and (4) is linked to a C-7 amine at its 3' terminus.
94. (Previously Presented) The method of claim 85, wherein

the fluorescent dye which is linked to the primer in step (B)(2) is Texas red.

95. (Previously Presented) The method of claim 85, wherein the sample is a serum sample.

96. (Currently Amended) A method for identifying a wildtype human hepatitis B virus surface antigen in a sample which comprises:

- (A) obtaining a viral nucleic acid from the sample;
- (B) amplifying the viral nucleic acid in a polymerase chain reaction using two primers, wherein
 - (1) one primer is a first oligonucleotide which (i) has consists of the sequence AGGATCAACAACAACCGTA (SEQ ID NO:6), and (ii) is linked at its 5' terminus to a biotin group; and
 - (2) the other primer is a second oligonucleotide which (1) has consists of the sequence ATCGTCCTGGGCTTTCGCAA (SEQ ID NO:7), and (2) is linked at its 5' terminus to a fluorescent dye;
- (C) obtaining, from the amplified nucleic acid, single stranded nucleic acid which comprises the fluorescent dye; and
- (D) contacting the single stranded nucleic acid which comprises the fluorescent dye to an immobilized third oligonucleotide, which oligonucleotide comprises a sequence which (1) corresponds to a portion of a wildtype human hepatitis B virus surface antigen nucleic acid, (2) is linked to a fluorescent dye at its 5' terminus; and (3) is linked to a primary amine group at its 3' terminus,

under conditions permitting hybridization between the single stranded nucleic acid which comprises the fluorescent dye and the third oligonucleotide, wherein hybridization between the single stranded nucleic acid which comprises the fluorescent dye and the third oligonucleotide identifies the sample as one containing a wildtype human hepatitis B virus surface antigen.

97. (Previously Presented) The method of claim 96, wherein the third oligonucleotide comprises the sequence TACGGACGGAAACT (SEQ ID NO:3).
98. (Previously Presented) The method of claim 96, wherein the third oligonucleotide comprises the sequence TACGGACGGAAACTGTTTTTTTTTTT (SEQ ID NO:4).
99. (Previously Presented) The method of claim 96, wherein the fluorescent dye which is linked to the third oligonucleotide is 6-(fluorescein-6-carboxamido) hexanoate.
100. (Previously Presented) The method of claim 96, wherein the primary amine group which is linked to the third oligonucleotide is a C-7 amine.
101. (Previously Presented) The method of claim 96, wherein the third oligonucleotide is immobilized on a solid support.
102. (Previously Presented) The method of claim 101, wherein

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the solid support is a glass bead.

103. (Previously Presented) The method of claim 96, wherein the third oligonucleotide (1) is immobilized; (2) comprises the sequence TACGGACGGAACTGTTTTTTTTTTTTT (SEQ ID NO:4); (3) is linked to 6-(fluorescein-6-carboxamido) hexanoate at its 5' terminus, and (4) is linked to a C-7 amine at its 3' terminus.
104. (Previously Presented) The method of claim 96, wherein the fluorescent dye which is linked to the primer in step (B) (2) is Texas red.
105. (Previously Presented) The method of claim 96, wherein the sample is a serum sample.